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**HUMAN
RESOURCES**

CONTENT DATA MODEL (CDM) AND
IMPROVED TECHNICAL DATA SYSTEM (ITDS)
COMPATIBILITY ANALYSIS

Ron Schroder
Thomas A. Teall
Robert Millhouse

RJO Enterprises, Incorporated
101 Woodman Drive
Dayton, Ohio 45431

LOGISTICS AND HUMAN FACTORS DIVISION
Wright-Patterson Air Force Base, Ohio 45433-6503

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Logistics and Human Factors Division

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Chief, Logistics and Human Factors Division

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<p>This effort examines the current potential for compatibility between two developing specifications for the description and exchange of digital technical maintenance information. The comparison analysis performed is a continuation of an effort directed toward the development of specifications for future automated information processing capabilities. The two specifications include the Content Data Model (CDM), being developed by the Air Force Human Resources Laboratory (AFHRL) with assistance provided by RJO Enterprises, Incorporated, and the Improved Technical Data System (ITDS), which is being developed by Northrop Corporation.</p> <p>Both the CDM and ITDS use the Standard Generalized Mark-Up Language (SGML) ISO 8879-1986 to "tag" and identify technical maintenance information. SGML data identification is used to support the delivery of technical data in accordance with Military Specifications. Each system provides support for both the electronic presentation of technical data and the production of hard copy documents.</p>				
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The analysis performed revealed a fundamental difference in their implementation techniques. ITDS models technical data as a linear stream of information, with SGML commands embedded within text and tabular data. In the CDM, maintenance data are modeled hierarchically and are identified according to "content" structure, with SGML mark-up codes used to identify information classes such as "system information," "functions," "tasks," and "steps."

Obvious differences exist between ITDS and the CDM; however, despite these differences, the two systems are expected to be compatible. Compatibility is expected as a result of the demonstrated flexibility to make changes during the continuing development of both systems. As a result of this investigation, it is also anticipated that a suitable mapping scheme can be developed to allow for the exchange of maintenance information between the two systems.

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CONTENT DATA MODEL (CDM) AND IMPROVED
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Ron Schroder
Thomas A. Teall
Robert Millhouse

RJO Enterprises, Incorporated
101 Woodman Drive
Dayton, Ohio 45431

LOGISTICS AND HUMAN FACTORS DIVISION
Wright-Patterson Air Force Base, Ohio 45433-6503

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This publication is primarily a working paper. It is published solely to document work performed.

SUMMARY

This document

The present effort examined the potential for compatibility between two developing specifications for the description and exchange of digital technical maintenance information. The comparison analysis performed was a continuation of an effort directed toward the development of specifications for future automated information processing capabilities. The two specifications include the Content Data Model (CDM), being developed by the Air Force Human Resources Laboratory (AFHRL) with assistance provided by RJO Enterprises, Incorporated, and the Improved Technical Data System (ITDS), which is being developed by Northrop Corporation.

Both the CDM and ITDS use the Standard Generalized Mark-Up Language (SGML) ISO 8879-1986 to "tag" and identify technical maintenance information. SGML data identification is used to support the delivery of technical data in accordance with Military Specifications. Each system provides support for both the electronic presentation of technical data and the production of paper documents. *Keywords: Electronic Technical Data Systems (ETDS)*

The analysis performed revealed a fundamental difference in the two implementation techniques. ITDS models technical data as a linear stream of information, with SGML commands embedded within text and tabular data. CDM models maintenance data hierarchically and data are identified by their "content" structure, with SGML mark-up codes used to identify information classes such as "system information," "functions," "tasks," and "steps."

There are obvious differences that exist between the ITDS and the CDM. Despite the differences in their implementation methodologies, the two systems are expected to be compatible. Compatibility is expected as a result of the demonstrated flexibility to make changes during the continuing development of both systems. As a result of this effort, it is also anticipated that a suitable mapping scheme can be developed to allow for the exchange of maintenance information between the two systems.

PREFACE

The work described in this paper was performed in support of the Computer-Aided Acquisition and Logistics Support (CALS) initiative of the Air Force Systems Command. It was accomplished for the Air Force Human Resources Laboratory (AFHRL) by RJO Enterprises, Incorporated, under Department of Transportation contract DTRS-57-88-C-00033. First Lieutenant Mark J. Earl, AFHRL/LRC, served as the Laboratory technical monitor for the effort.

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
Background	1
Purpose	1
Scope	2
Applicable Documents	2
Government Documents	2
Non-Government Documents	2
Definition of Terms	2
Glossary	3
II. STUDY RESULTS	3
ITDS Overview	3
CDM Overview	3
Differences	4
Branching	4
Parts Data	5
Associations	5
Configuration	5
III. RECOMMENDATIONS	6
IV. CONCLUSIONS	6
APPENDIX A: ITDS/CDM COMPARISON STUDY	7
APPENDIX B: CDM/ITDS COMPARISON STUDY	53

CONTENT DATA MODEL (CDM) AND IMPROVED TECHNICAL DATA SYSTEM (ITDS) COMPATIBILITY ANALYSIS

I. INTRODUCTION

This section describes the purpose of the present effort and provides background information on the circumstances that led to this effort.

Background

The development of electronic technical order systems such as the Improved Technical Data System (ITDS), the Automated Technical Order System (ATOS), and the Integrated Maintenance Information System (IMIS) has required a detailed analysis of the entire collection of maintenance information. Previous analysis efforts have revealed that common data elements are shared across a family of maintenance manuals. The extraction of common content elements into a Standard Generalized Mark-Up Language (SGML) Document Type Definition (DTD) will more accurately and completely represent the data with less redundancy than do current methods.

The identification of common elements through the use of SGML ISO 8879-1986 will make it possible to translate data from existing systems into an instance of the "Organizational Level (O-level) maintenance set" DTD. This DTD will combine the essential content elements found in the family of manuals associated with MIL-M-83495. The DTD can be viewed in different ways by various output systems. One output system may generate traditional paper job guides; another may produce general vehicle manuals; and yet another may produce a data base that will run on an alternate electronic system.

The present effort was a continuation of previous work done for the Air Force Human Resources Laboratory (AFHRL). Past work involved the analysis of O-Level maintenance information and the development of the Content Data Model (CDM). The CDM, like the ITDS, is an information representation methodology that uses SGML to identify content elements and their relationships. Both the ITDS and CDM systems are developing specifications for the description and exchange of digital maintenance information intended for hard copy and electronic display.

Purpose

The purpose of this effort was to analyze both the CDM and ITDS DTDs and to determine the compatibility of the CDM and ITDS data structures. The analysis was required in order to recommend modifications to the CDM and ITDS data structures and to extract the content elements into a DTD that could be submitted to the Computer-Aided Acquisition Logistics Support (CALS) steering group. This effort was undertaken to assure that the CDM is an acceptable standard for the exchange of maintenance information and that ITDS data will be compatible with the CDM. Additionally, this study was to provide a foundation for the development of processing routines required to perform data conversions.

Scope

The scope of this effort was to document the analysis of both the CDM and ITDS specifications for the description and exchange of digital technical maintenance information. This study provides a comparison of common elements identified within the ITDS data structures and those represented in the CDM. The actual element-by-element comparisons can be found in Appendixes A and B.

Applicable Documents

Government Documents

MIL-M-83495, Organizational Level Maintenance Instruction Sets for Vehicle and Systems Manuals

MIL-M-28001, Mark-Up Requirements and Generic Style Specification for Electronic Printed Output and Exchange of Text

Non-Government Documents

Final Report - Content Data Model of Organizational Maintenance Information for Automated Interchange of Technical Source Data. Chicago, Illinois, Datalogics Inc., 7 July 1988.

SGML Mark-Up Codes for ITDS Electronic Output. DoD Computer-Aided Acquisition Logistics Support (CALs), Aerospace Industry Association: 29 June 1988. Appendixes B-1 and B-2.

Definition of Terms

The following definitions of terms were taken from MIL-M-28001:

ATTRIBUTE (DEFINITION) LIST: A mark-up declaration that associates an attribute definition list with one or more element types.

ATTRIBUTE (of an element): A characteristic quality, other than type or content.

DOCUMENT TYPE DEFINITION: Rules, determined by an application, that apply SGML to the mark-up of documents of a particular type. A DTD includes a formal specification, expressed in a document type declaration, of the element types, element relationships and attributes, in references that can be represented for mark-up. It thereby defines the vocabulary of the mark-up for which SGML defines the syntax.

ELEMENT: A component of a hierarchical structure defined by a document type definition. It is identified in a document instance by descriptive mark-up, usually a start-tag and end-tag, shown as:

```
<element_name attribute = value> content of element  
<element_name attribute = value>
```

SGML: Standard Generalized Mark-Up Language, as detailed in International Standard 8879. It is a meta-language that "provides a coherent and unambiguous syntax for describing whatever a user chooses to identify within a document."

Glossary

The following acronyms and abbreviations are used throughout this paper:

AFHRL	Air Force Human Resources Laboratory
ATOS	Automated Technical Order System
CALS	Computer-Aided Acquisition Logistics Support
CDM	Content Data Model
DTD	Document Type Definition
IMIS	Integrated Maintenance Information System
IPB	Illustrated Parts Breakdown
ITDS	Improved Technical Data System
MPL	Maintenance Parts List
OS	Output Specification
SGML	Standard Generalized Mark-Up Language
TD	Technical Data

II. STUDY RESULTS

This section details findings resulting from the analysis of the SGML elements identified in both the CDM and the ITDS. Identified below are ITDS and CDM system overviews, along with differences found to exist between the two systems and recommendations made to improve compatibility. Appendixes A and B contain CDM and ITDS element-by-element comparative analysis results.

ITDS Overview

The ITDS is an advanced technical data system which uses the SGML representation scheme. ITDS is an interactive information delivery system that supports the presentation of technical data (TD) to users engaged in the operation, maintenance, training, and support of equipment and systems. ITDS models TD as a linear stream of information with SGML commands embedded within text and tabular data. The SGML mark-up codes identify the type/nature of the TD which follow, and specify sizing/positioning/color for the electronic display or paper printing of the TD. Through the use of SGML DTDs, an application can rigorously define a class of documents such as job guides, flight manuals, and fault isolation procedures.

CDM Overview

In the CDM, maintenance data are modeled hierarchically, with SGML element tags used to describe the content and data base structures associated with MIL-M-83495. CDM identifies maintenance information by its "content" structure, with SGML mark-up codes used to identify information classes such as "system information," "functions," "tasks," and "steps." This is a radical

departure from traditional paper documents where a linear order is assigned. However, this methodology is designed to allow the delivery of information in a manner known as hypertext. In hypertext delivery, the order in which data are viewed may be unique for each user, depending on the task and the user's level of expertise. The CDM is an attempt to more accurately and completely represent the data that are found in the present maintenance manuals, with less data redundancy than occurs with current methods.

Differences

The basic differences which exist between the ITDS and CDM may be attributed to their implementation methodologies. ITDS models TD as a linear stream of information, with SGML commands embedded within text and tabular data. In the DCM, maintenance data are modeled hierarchically and SGML mark-up codes are used to identify maintenance information "content" structure. As a result, there are minor differences in the system-supported features of each. Differences in branching, parts data, associations, and configuration control are listed below.

Branching

Branching and linking schemes in general are key to the overall capability to link and present text, graphics, warnings, or supplementary information. Providing extensive branching capabilities, transparent or user-driven, offers greater flexibility in creating a customized, interactive information presentation. Branching capabilities as implemented within the CDM and ITDS, although distinctly different, provide sufficient compatibility.

In ITDS, the basic branch element, "<branch>," simply causes the system to branch to a specified place in a document. The system will then continue from the new location. This branching feature is comparable to a FORTRAN "GO TO" statement. Additional branching capabilities are provided through the definition of branching attributes. Use of the branch definition element, "<branchdef>," allows the system to accept user inputs to explicit questions and to branch based upon the user's response. ITDS also has the ability to maintain a record of user inputs through specification of the SGML "<store>" element. Additionally, ITDS can apply multiple conditions on branching; this feature provides compatibility with the CDM. This operation is accomplished through the use of the "previous" attribute of the branch element.

Within CDM, branching is accomplished through the data link element, "<datalink>," and its associated attribute sets, "%links" and "%xrefs." The CDM link structure provides further capability beyond simple branching. The CDM hierarchical content structure and link attribute set support an internal cross-referencing system which employs query and testing based on user-supplied information and experience. Use of the attributes "value," "branchid," "rulelog," and "sequence" of the "%links" attribute set allows the CDM to emulate the decision-making process by applying rule logic to current or previously "learned" user inputs. This linking scheme allows for the storage and retrieval, at a later time, of information gathered from user responses to system-generated prompts.

Parts Data

Illustrated Parts Breakdowns (IPBs) and Maintenance Parts Lists (MPLs) which identify parts information are identified differently by the ITDS and CDM systems.

ITDS handles parts lists as tables, with individual parts being identified as table entries. Following this convention, the table identification element, "<table>," will precede the MPL, and each succeeding part in the list will be preceded with an "<entry>" element tag. This allows access to MPL tables through cross-referencing and branching. Individual parts list entries can be manipulated or used to derive composite pieces of information.

In the CDM, MPLs are individual records of information about the parts which make up the particular MPL, such as figure and index number, reference designator or units per assembly. This organization allows the table to be manipulated and updated on an individual row basis. Additionally, parts information identified by the tag element "<partinfo>," has the attribute of "partbase." The value of "partbase" is the unique identifier of the partbase information for a part. Partbase information, "<partbase>," is that information which does not change across MPLs, such as the part number or Federal Stock Control Number (FSCN).

Associations

Associations are unique to ITDS and are divisions created primarily for presentation on an electronic display. An association, as defined by ITDS, is a basic unit of closely related data. Associations consist of electronic "pages" of information or frames. A frame is the electronic equivalent of a page from a printed document. The frame contains a portion of the total information that appears on its corresponding printed page. This feature results from associations and frames being designed to approximate the formatting required for an electronic display. Within ITDS, the primary intention for associations is to link steps or text with a graphic and to display both text and graphic on the same screen.

The CDM is designed to support dynamic information delivery, which inherently eliminates the concept of "pages" of information. Information to be delivered to the user is not determined until the user actually makes a request for information. Information requests use the CDM internal cross-referencing and embedded intelligence of the content structure to provide the technician with only that information required to accomplish the current task.

Configuration

ITDS configuration coding provides the capability to store and retrieve groups of related data. Configuration data are coded into specific groups of information as these groups appear and configurations are identified in the ITDS electronic page-oriented system. This implementation method allows the user to select configuration-specific data. ITDS supports modeling of configuration-sensitive data down to the lowest level (i.e., step). This

feature allows for multiple cross-referencing to supplementary support data such as figures, graphics, or tables.

CDM methodology allows the specification of configuration through the use of the "config" and "version" attributes of the "%stats" attribute set. This organization allows configuration differences to be embedded to the smallest element, which also provides for the elimination of redundant configuration data. This configuration technique allows configuration-specific information to be incorporated into the dynamic delivery process.

III. RECOMMENDATIONS

Naming conventions for tag sets should exhibit consistency and be established to restrict potential redundancy in information identification. For example, within ITDS, a writer could possibly code a national stock number (NSN) using two methods: by using a texttype attribute (texttype = 637) or by using the NSN element tag (<nsn>). For improved consistency in information identification, start and end tags for a given element should differ only in the existence of a forward slash (/) in the end tag. For example, ITDS would use "<doc>" (document start) and "</doc>" (document end) and not the "<assocst>" (association start) and "<assocend>" (association end) element tags.

Associations are used primarily for the selective grouping of information for presentation on an electronic display. It is suggested that a definition of associations be developed that defines the groupings in terms of data content rather than for electronic formatting.

IV. CONCLUSIONS

The comparative analysis provided recommended modifications to the CDM and ITDS data structures. These suggested changes have ensured that any data acquired and stored in the respective data structures will be compatible. Changes made to the CDM have made it an acceptable standard for the exchange of maintenance information.

The general recommendations listed, along with specific element tag and tag attributes recommendations, have been reviewed by ITDS and CDM representatives. These recommendations have been incorporated into the current ITDS and CDM specifications. The incorporation of these recommendations has ensured the compatibility of the two systems and has enhanced the development of a mapping scheme between the two systems. Although compatibility between the ITDS and CDM systems has been verified, the fundamental differences in their implementation techniques remain. However, these differences, which are inherent to the goals and objectives of each system, will not prohibit the exchange of technical maintenance information between the two systems.

APPENDIX A

ITDS/CDM COMPARISON STUDY

This appendix details the results of a data structure analysis of the Content Data Model and the Improved Technical Data System using ITDS as the baseline for the comparative analysis.

APPENDIX A

Table of Contents

<u>Section</u>	<u>Page</u>
1.0 ITDS Mark-Up Codes - Appendix B1.	9
1.1 Attribute Sets and Definitions.	9
1.2 Cover and Title Frame/Page.	12
1.3 Other Front Matter.	19
1.4 Paragraphs, Headings, and Text.	23
1.5 Illustrations/Figures	25
1.6 Warnings, Cautions, Notes, and Footnotes.	26
1.7 Tables, Charts, and Lists	27
1.8 Rear Matter	29
1.9 Special/Foreign Language Characters	31
1.10 Automatic Text, Illustration and Table Numbering	32
1.11 Automatic Page Numbering and Page Breaks.	33
1.12 Marginal Copy	34
1.13 Entity Definition and Use	35
2.0 ITDS Mark-Up Codes - Appendix B2.	36
2.1 Associations.	36
2.2 Viewports	37
2.3 Graphic Callouts.	38
2.4 Branching	39
2.5 Interrupt, Jump, and Return	41
2.6 Highlights, Emphasis Codes, Change and Emergency Information, Global Definitions	42
2.7 Video Disk.	44
2.8 Configuration	45
2.9 Standard Keys	46
2.10 Cross-Reference and Data Identification	47
2.11 Special Codes	48
2.11.1 <u>Document Structure Reference Codes.</u>	48
2.11.2 <u>Task Numbers.</u>	49

1.0 ITDS Mark-Up Codes - Appendix B1

This appendix provides a working subset of the SGML codes used by the Department of Defense (DoD), Computer-Aided Acquisition Logistics System (CALs), and Aerospace Industry for the printing and electronic display of technical publications.

1.1 Attribute Sets and Definitions

<u>ATTRIBUTE SET</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
%applic		Not Applicable	1.
%bodyatt		%bodyatt, %content, %ids	
	%applic	As for %applic	
	inschlvl	%bodyatt version	
	delchlvl	%bodyatt version	
	texttype	%content type	2.
	itemid	sssn/nsn	3.
	val	%bodyatt valstat	
	verif	%bodyatt verstat	
	form		4.
	xrefid	%ids	5.
%colfmt		<table\<colhddef	6.
	%applic	As for %applic	
	%emph	As for %emph	
	colnum	colnum	
	lead	Not Applicable	
	leader	Not Applicable	
	char	Not Applicable	
	percent	Not Applicable	
	colsep	Not Applicable	
	rowsep	Not Applicable	
	hspace	Not Applicable	
	hrule	Not Applicable	
	vspace	Not Applicable	
	vrule	Not Applicable	
%color	color	Not Applicable	7.

<u>ATTRIBUTE SET</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
%emph	bold	%links priority	
	box		
	boxtouch		
	circle		
	cirtouch		
	col		
	flashing		
	font		
	hcp		
	hex		
	hextouch		
	intrwdmi		
	intrwdmx		
	intrwdnm		
	lead		
	lftindnt		
	orient		
	orphan		
	pggroup		
	pitch		
	primary		
	print		
	quad		
	reverse		
	rtindnt		
	size		
	stet		
	strike		
	style		
	underscr		
	verbatim		
	window		
%security	security	%secur security Not Applicable	8.
	type		
	restrict		
	release		
	codeword		
	scilevel		
	diglyph		
%yesorno		%yesorno	

DETAIL REFERENCES

1. %applic - Used for format/Restrict usage
- applic = print|port|shop|prime|
ate|trainer|electron|
voice|all
2. %bodyatt texttype - ITDS uses 3-digit code for
classification of data.
Reference Section 3.2.11.2
3. %bodyatt itemid - Used for item identification/unique
identifier.
4. %bodyatt form - CDM attribute to describe text as
descriptive or procedural, nature, is
found in multiple tags.
5. %bodyatt xrefid - Identifies current document structure
(CDM identifies referenced item)
ex. xrefid = 012-4-12 is Table 4-12
Reference Section 3.2.11.1
6. %colfmt - Added column data type to DTD but
not to B1
- lead, leader, char, percent, colsep
rowsep, hspace, hrule, vspace, vrule
are not applicable to CDM because CDM
does not maintain output format data
7. %color - Not applicable because CDM does not
maintain output format data
8. %security type - Due to possible differences in the
intended users, ITDS requires this
attribute but CDM has no need for it.
- This attribute is not in MIL-M-28001

1.2 Cover and Title Frame/Page

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<doc	%secur branch status revno chgn itidtype mantype xrefid	<maintinf As for %security CDM Derivable CDM Derivable Not Applicable Not Applicable CDM Derivable CDM Derivable id	1.
<volume	%secur %bodyatt	CDM Derivable As for %security As for %bodyatt	
<cover	%secur %bodyatt	CDM Derivable As for %security As for %bodyatt	
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<docno	%secur	Not Applicable	2.
<user	%secur	Not Applicable	2.
<titleblk	%secur	CDM Derivable As for %security	

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<revnum	%secur	<idinfo\ <dataunit version As for %security	
<caveat	%secur	<datalink linktype = warning As for %security	
<docclass	%secur	Not Applicable	3.
<tfmclass	%secur	Not Applicable	4.
<docuse	%secur	No Equivalent	5.
<volnum	%secur	CDM Derivable As for %security	
<doccopy	%secur	No Equivalent	6.
<docpart	%secur	CDM Derivable As for %security	
<subject	%secur	<idinfo\ <dataunit type=subject <datalink linktype = title <sysinfo\ <idinfo\ <dataunit type = subject <datalink linktype = title As for %security	
<maintlvl	%secur	<idinfo\ <dataunit type = maint_level <sysinfo\ <idinfo\ <dataunit type = maint_level As for %security	
<nomen	%secur	<function\ <task\ <equip\ <dataunit type = nomen <sysinfo\ <function\ <task\ <equip\ <dataunit type = nomen <sysinfo\ <fltinfo\ <statiso\ <equip\ <dataunit type = nomen As for %security	
<doctype	%secur	Not Applicable As for %security	7.

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<sssn	%secur	<maintinf sssn As for %security	
<type	%secur	<function\<task\<input\ <equip type <sysinfo\<function\<task\ <input\<equip type <sysinfo\<fltinfo\<statiso\ <equip type <data\<textunit\<equip type As for %security	8.
<docpartn	%secur	CDM Derivable As for %security	
<modelno	%secur	<idinfo\ <dataunit type = modelno <sysinfo\<idinfo\ <dataunit type = modelno As for %security	
<pslist	%secur	<sysinfo\<partdata\<ipb\<mpl As for %security	
<partno	%secur	<sysinfo\<partdata\<partbase\ <dataunit type = part number As for %security	
<nsn	%secur	<function\<task\ <equip nsn <sysinfo\<fltinfo\<dynaaiso\ <mdas\<rectif nsn <partbase type = nsn As for %security	
<stitle	%secur	<idinfo\<dataunit type = subtitle\<datalink linktype = title As for %security	
<serno	%secur	<idinfo\ <dataunit type = serial number <sysinfo\<idinfo <dataunit type = serial number As for %security	

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<mfr		<idinfo\ <dataunit type = manufacturer <sysinfo\<<idinfo\ <dataunit type = manufacturer As for %security	
	%secur		
<docmfr		<idinfo\<<dataunit = docmfr As for %security	
	%secur		
<contrno		<idinfo\ <dataunit type = contract no. <sysinfo\<<idinfo\ <dataunit type = contract no. As for %security	
	%secur		
<partdesc		<sysinfo\<<partdata\<<ipb\ <mpl\<<partinfo As for %security	
	%secur		
<partname		<sysinfo\<<partdata\<<ipb\ <mpl\<<partinfo\ <dataunit type = noun ident As for %security	
	%secur		
<seal		<graph2d As for %security	9.
	%secur		
	cmdid	No Equivalent	
	graphic	srcgraph	
	width	pixrange	
	depth	pixrange	

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<notice			10.
	%secur		
	type		
	effdate	<idinfo\<dataunit type = effdate	
	supersede	<idinfo\<dataunit type = supersede	
	auth	<idinfo\<dataunit type = auth	
	distr	<idinfo\<dataunit type = distr	
	nopg	CDM Derivable	
	noclaspg	CDM Derivable	
	branch	CDM Derivable	
	disc	<idinfo\<dataunit type = disc	
	safesup	<idinfo\<dataunit type = safesup	
	opersup	<idinfo\<dataunit type = opersup	
	fouo	Not Applicable	
	pgclass	CDM Derivable	
	pubby	Not Applicable	
<dwgrev		<idinfo\<dataunit type = dwgrev	
	%secur		
<pubdate		<idinfo\<dataunit type = orig info release date <sysinfo\<idinfo\<dataunit type = orig info release date	
	%secur	As for %security	
<chgdate		<idinfo\<dataunit type = latest info change date <sysinfo\<idinfo\<dataunit type = latest info change date	
	%secur	As for %security	
<chgno		<idinfo\ <dataunit version	
	%secur	As for %security	
<downgrd		<idinfo\<dataunit type = downgrd	
	%secur		

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<auth		<idinfo\<dataunit type = auth	
	%secur		
<phrase		Not Applicable	11.
	%secur		
<dtissue		<idinfo\ <dataunit type = effective date <sysinfo\<idinfo <dataunit type = effective date As for %security	
	%secur		

DETAIL REFERENCES

1. doc status - Redundant with <doctype>
doc revno - Number of times document revised
doc chgno - Number of times document changed
2. <docno, <user - Both can be derived from either pubno or
prepubno
3. docclass - Redundant with doc security
4. tfmclass - Redundant with <titlefrm security and
%security restric
5. docuse - Provides (For Official Use Only)
6. doccopy - Provides (Copy ___ Out of ___)
7. doctype - Redundant (format) with <doc status>?
8. <type - Used in ITDS to identify equipment type
9. <seal cmdid - CDM does not identify
10. <notice
type = fouo - Data supplied by security = fouo
type = pubby - Data supplied by <docmfr
11. <phrase - Data supplied by <dwngrd

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<chgreg	%secur %bodyatt	CDM Derivable As for %security As for %bodyatt	
<contents	%secur	CDM Derivable As for %security	
<autotoc	elements num title page	CDM Derivable	
<iluslist	%secur	CDM Derivable As for %security	
<autoloi	elements num title page	CDM Derivable	
<tablist	%secur	CDM Derivable As for %security	
<autolot	elements num title page	CDM Derivable	
<warnsum	%secur %bodyatt	CDM Derivable As for %security As for %bodyatt	
<safesum	%secur %bodyatt	CDM Derivable As for %security As for %bodyatt	
<howtouse	%secur %bodyatt	<idinfo type = howtouse As for %security As for %bodyatt	
<forward	%secur %bodyatt	<idinfo type = forward As for %security As for %bodyatt	
<symsect	%secur %bodyatt	<sysinfo\<desc	2.

1.3 Other Front Matter

Mark-up tags covered in this section deal with information identified as Front Matter. Front Matter consists of various paper manual constructs including Table of Contents (TOC), Lists of Illustrations (LOI), List of Effective Pages (LEP), etc. In general, the CDM does not contain equivalent commands for this type of information. The CDM derives compiled information based on the information obtained at each lower node.

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<chgsheet	%secur %bodyatt	<dataunit version As for %security As for %bodyatt	
<lep	%secur	CDM Derivable As for %security	
<autolep	%secur	CDM Derivable As for %security	
<promul	%secur %bodyatt	<idinfo type = promul As for %security As for %bodyatt	
<sigblk	type	Not Applicable	1.
<purpose	%secur	No Equivalent	1.
<signer	%secur	No Equivalent	1.
<position	%secur	No Equivalent	1.
<organiz	%secur	No Equivalent	1.
<address	%secur	No Equivalent	1.
<date	%secur	No Equivalent	1.

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<term		<dictitem\ <dataunit type = term As for %security	
	%secur		
<preface		<idinfo type = preface As for %security As for %bodyatt	
	%secur		
	%bodyatt		
<intro		<idinfo type = intro As for %security As for %bodyatt	
	%secur		
	%bodyatt		

DETAIL REFERENCES

1. sigblk
 - CDM will know where to place a signature block; therefore, it does not need to identify it. However, to display the elements of the signature block, the CDM must store the data someplace. Suggest CDM add appropriate data units within idinfo to store such data.
2. symsect
 - appropriate data unit type must be added

1.4 Paragraphs, Headings, and Text

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<chapter	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<title	%secur	<datalink linktype = title As for %security	
<num	type figsheet xrefid	CDM Derivable	
<section	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<para0	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<subpara1	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<subpara2	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<subpara3	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<subpara4	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<subpara5	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<runtext	%secur %bodyatt	<textunit As for %security As for %bodyatt	
<text1	%secur %bodyatt	<textunit As for %security As for %bodyatt	

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<text2	%secur %bodyatt	<textunit As for %security As for %bodyatt	
<paratxt1	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<paratxt2	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<paratxt3	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<paratxt4	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<paratxt5	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<paratxt6	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<paratxt7	%secur %bodyatt	<dataunit level As for %security As for %bodyatt	
<pgno	%secur	Not Applicable As for %security	1.

DETAIL REFERENCES

1. <pgno - CDM will supply all page numbering

1.5 Illustrations/Figures

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<figure	%secur %applic %bodyatt type	CDM Derivable As for %security As for %applic As for %bodyatt	
<graphic	%secur boardno width depth window rotations segment name coord type	<graph2d As for %security %ids pixrange pixrange Not Applicable - Discuss orient srcgraph name Not Applicable type	1.
<graphlit	%color boardno segment flashing	Not Applicable	2.
<graphmac	%secur name boardno segment coord window type	<graph2d As for %security name %ids srcgraph Not Applicable Not Applicable type	1.
<legend	%secur	<table As for %secur	
<legitem	%secur	<table\<entry As for %secur	

DETAIL REFERENCES

1. window - Datalogics to analyze and provide capability
2. <graphlit - CDM does not maintain output format data

1.6 Warnings, Cautions, Notes, and Footnotes

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<warning		<datalink linktype = warning	1.
	%secur vital type xrefid	As for %security Not Applicable <dataunit type = warning linkid	
<caution		<datalink linktype = caution	
	%secur type xrefid	As for %security <dataunit type = caution linkid	
<note		<datalink linktype = note	
	%secur type xrefid	As for %security <dataunit type = note linkid	
<ftnotest		<datalink linktype = ftnote	
	%secur %bodyatt mark type	As for %secur As for %bodyatt CDM Derivable CDM Derivable	
<ftnotend		No Equivalent	
	%secur %bodyatt mark type		

DETAIL REFERENCES

1. <warning vital - All warnings are vital

1.7 Tables, Charts, and Lists

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<table	%secur	As for %security	
	%bodyatt	As for %bodyatt	
	%applic	As for %applic	
	feature	<table type	1.
	titleform	<table type	1.
	ckmethod	<table type	1.
	siderule	Not Applicable	2.
	colsep	Not Applicable	2.
rowsep	Not Applicable	2.	
<colhddef		<table\<colhddef	
	%colfmt	As for %colfmt	
<colbddef		Not Applicable	3.
	%colfmt enumeth		
<entry		<table\<entry	4.
	%secur	As for %security	
	%bodyatt	As for %bodyatt	
	col	col	
	row	row	
	type	Not Applicable	
	rowsep	Not Applicable	
	rotate	Not Applicable	
<list		<table	5.
	%secur	As for %security	
	%applic	As for %applic	
	enumeth	Not Applicable	
	align	Not Applicable	
	char	Not Applicable	
<smrcode		<sysinfo\<partdata\ <partbase type = smr	
<item		<table\<entry	
	%secur	As for %secur	
%bodyatt	As for %bodyatt		
<refdes		<sysinfo\<partdata\ <ipb\<mpl\<partinfo type = reference designator	
	%secur	As for %security	
<lin		Not Applicable	6.
	%secur		

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<tab	char position	Not Applicable	7.

DETAIL REFERENCE

1. <table feature
ckmethod titleform - Is <table type> valid for feature,
titleform and ckmethod?
- (May Be Derivable)
2. <table siderule
colsep - CDM does not maintain output format
rowsep data
3. <colbdf - CDM does not maintain output format
data
4. <entry type
rowsep - CDM does not maintain output format
rotate data
5. <list
enumeth - Lists within the CDM are treated as
align tables consisting of one column.
char - CDM does not maintain output format
data
6. <lin - CDM does not maintain output format
data
7. <tab - CDM does not maintain output format
data

1.8 Rear Matter

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<appendix	%secur %bodyatt	CDM Derivable	
<ftnsec	%secur %bodyatt	CDM Derivable As for %security As for %bodyatt	
<glossary	%secur %bodyatt	CDM Derivable As for %security As for %bodyatt	
<index	%secur %bodyatt	Not Applicable As for %security As for %bodyatt	1.
<indxflag	ref1 ref2 ref3 ref4 %secur	Not Applicable	1.
<foldout	%secur %bodyatt width depth	Not Applicable	
<autoindx	elements indxflag num title page	CDM Derivable Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable	1.
<ddsheets	%secur %bodyatt	Not Applicable	2.

DETAIL REFERENCES

- 1. Indexing
 - CDM will derive data to be included in an index. Appropriate level identification (such as elements = chapter/section/para/page = 1/0/1) will be known and included by the system.
- 2. <foldout
 - CDM does not maintain output format data
- 3. <ddsheets
 - All changes will be incorporated in the CDM version of documents

1.9 Special/Foreign Language Characters

The CDM does not currently allow for the capability to specify or store special character information. Special character information consists of symbols (i.e. arrows, bullets, superscripts, etc.) and foreign language characters. The process of adding these capabilities is in progress.

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<splchar	type	No Equivalent	
<subscrpt	%secur	No Equivalent	
<supscrpt	%secur	No Equivalent	
<speclang	type	No Equivalent	

1.10 Automatic Text, Illustration and Table Numbering

CDM will apply appropriate numbering methodologies (arabic, roman numerals, alphabetic, etc.) for every section of a document.

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<enumdef	method type element	Not Applicable	
<enumrst	method	Not Applicable	
<enumrend	method	Not Applicable	

1.11 Automatic Page Numbering and Page Breaks

Enumeration definitions within ITDS is used for identification of page numbering schemes (i.e. roman numerals, arabic, etc.) and automatic paging. All of these features are derived within CDM.

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<enpgdef		Not Applicable	
	method		
	type		
	model		
<enpgst		Not Applicable	
	method		
<enpgend		Not Applicable	
	method		
<pgintst		Not Applicable	
	number		
	cngno		
	%secur		
<pgintend		Not Applicable	
	number		
	cngno		
	%secur		

1.12 Marginal Copy

CDM will include appropriate data(pubnos, pgnos, etc.) within margins (in proper locations) as required.

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<marginal	%secur %applic status location element type %emph	Not Applicable	

1.13 Entity Definition and Use

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<!ENTITY x "char. string"		<textunit id = x	
&x;		<datalink linktype = appropriate branchid = x	

2.0 ITDS Mark-Up Codes - Appendix B2

The SGML mark-up codes provided in this appendix are intended to supplement the codes for electronic and printed output included in Appendix B1. The codes found in this appendix are intended primarily for use in the electronic display of documents.

2.1 Associations

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<assocst	%secur content viewtype xrefid	Not Applicable	1.
<assocend		Not Applicable	

DETAIL REFERENCE

1. associations - CDM does not maintain output format data

2.2 Viewports

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<viewdef	name coord device viewtype	Not Applicable	1.
<viewadd	name	Not Applicable	1.
<viewflod	%color shade	Not Applicable	1.
<viewdel	text graphic	Not Applicable	1.

DETAIL REFERENCES

1. viewports - CDM does not maintain output format data

2.3 Graphic Callouts

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<callout	label	No Equivalent	1.
	select		
	figxref		
<calltdef	label	No Equivalent	2.
	figxref		
	graphic		

DETAIL REFERENCES

1. callout - Textual reference to item in a figure or graphic
2. calltdef - Defines a callout so that when the system reaches text containing the callout it knows which figure or graphic to display.

2.4 Branching

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<branch	type	%links	
	branchid	<step reqtype	
	input	linkid	1.
	previous	linkid	2.
	%applic	As for %applic	
	dcno	exrefid	
	assoc	No Equivalent	
	xrefid	xrefid or branchid	3.
	label	No Equivalent	
<branchdf		No Equivalent	4.
	prompt	<datalink linktype = prompt	
	coordin	No Equivalent	
	echo	No Equivalent	
	time	No Equivalent	
	length	No Equivalent	
	end	No Equivalent	
	rectime	No Equivalent	
	recinput	No Equivalent	
	source	No Equivalent	5.
	recattmp	No Equivalent	
	delspace	No Equivalent	
	delperid	No Equivalent	
	delpunct	No Equivalent	
	revision	No Equivalent	
	replace	No Equivalent	
	recnum	No Equivalent	
	numattmp	No Equivalent	
	exactans	No Equivalent	
<store		No Equivalent	6.
	entity		

DETAIL REFERENCES

1. input - Used in ITDS to specify user required input. If input is defined to be data, conditional branching can be specified which is comparable to the CDM rulelog attribute.
2. previous - ITDS specification of previous branches. CDM implementation uses the sequence attribute to allow for specification of any branching sequences.
3. xrefid - CDM uses xrefid if branching to another dataunit and branchid if branching to another conditional branch.
4. <branchdf - ITDS element which defines branch capabilities. CDM branching capabilities are defined as part of the CDM model.
5. source - ITDS specification for the source of input as keyboard|ATE|touchpanel|etc. No apparent method within CDM to allow for this type of specification.
6. <store - Element within ITDS used to store user input values. Done automatically within CDM.

2.5 Interrupt, Jump, and Return

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<interrupt		Not Applicable	1.
<jumpout	doc assoc xrefid label	Not Applicable	2.
<return	loc	%links rulelog	

DETAIL REFERENCES

1. <interrupt - CDM system will automatically wait for user input.
2. <jumpout - CDM will not "run" other programs

2.6 Highlights, Emphasis Codes, Change and Emergency Information, and Global Definitions

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<chgst	level	<dataunit version	1.
	status	level	
	mark	Not Applicable	
	%secur	Not Applicable	
<chgend		As for %security	
	level	Not Applicable	
	status		
	mark		
<highlite	%secur		2.
	hrule		
	hspace		
	leader		
	lftindnt		
	linebrk		
	newcol		
	pgbrk		
	primary		
	rtindnt		
	shfthorz		
	shftvert		
	vrule		
	vspace		
<emphst			3.
<emphend	%applic	No Equivalent	
	%emph		
<emgst		No Equivalent	
<emgend	%applic	No Equivalent	
	%emph		
<emgst		Not Applicable	4.
<emgend		Not Applicable	

DETAIL REFERENCE

1. <chgst mark - CDM does not maintain output format data
2. <highlite - CDM does not maintain output format data
3. <emphst - Material that is to be emphasized is linked by a datalink with a specified priority. There is no need to identify a local section of emphasized material.
4. <emgst - Ouput Format Data.

2.7 Video Disk

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<video		<datalink	1.
	frames	linktype = video	
	speed	Not Applicable	
	audio	Not Applicable	

DETAIL REFERENCES

1. <video frames - CDM does not maintain output format data
speed
audio

2.8 Configuration

ITDS configuration coding allows the capability to store and retrieve groups of related data. CDM methodology allows the specification of configuration through the use of the %stats config attribute of the dataunit element. For more information about the use of configuration, reference section 2.3.4.

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<configid	type	<dataunit config	
	code	Not Applicable Not Applicable	
<configdf	type	Not Applicable	
	symbol output		
<configst	type	Not Applicable	
	code		
<configed	type	Not Applicable	
	code		

2.9 Standard Keys

This section contains data concerning keys to be used on the ITDS keyboard. This section does not apply to the comparison of how data is stored in the two systems.

2.10 Cross-Reference and Data Identification

<u>ITDS ELEMENT</u>	<u>ATTRIBUTE</u>	<u>CDM EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<xref	type	<datalink linktype	1.
	docno	<maintinfo id	2.
	assoc	Not Applicable	
	xrefid	<datalink linkid linktype = table graph2d graph3d etc.	
	text	<datalink linktype = prompt	3.
<dataiden	texttype		4.
	%secur	As for %security	

DETAIL REFERENCES

1. type - type = figure|text|table
possibly redundant with information in xrefid
2. docno - Docno in ITDS specifies a cross-reference to
another document. Assumed CDM cross-reference
to alternative maintenance information.
3. text - ITDS uses text as a specification for text
that is to be highlighted. CDM uses a textunit
identifier for the actual text and is linked
via the linktype specification.
4. texttype - Data identification information indicated by
the ITDS Task Codes ("texttype") can be
"mapped" into CDM format using the CDM
information structures identified in section
2.11.2
Provides capability of multiple texttypes for
a piece of text.

2.11 Special Codes

Special codes within the ITDS are used to enable cross-referencing which is necessary for branching and query commands. These codes are used universally from document to document.

2.11.1 Document Structure Reference Codes

This list represents the ITDS document structure codes identifying the major divisions of a document. These special number codes are coded in the reference numbers (xrefid) for the identified divisions.

<u>NUMBER</u>	<u>DOCUMENT STRUCTURE</u>
01	Title Page
02	List of Effective Pages
03	(Future Use)
04	Table of Contents
05	List of Illustrations
06	List of Tables
07	Forward, Introduction (Front Matter)
08	Chapter -- major division of manual
09	Section -- major division of manual
010	Part -- major division of manual
011	Illustration
012	Table
013	Appendix
014	Index
015	Legend of an Illustration
016	Footnote
017	Change Notice
018	Glossary
019	How to Use Document
020	Promulgation
021	Change Record
022	Difference Data Sheet
023	Abbreviations
024	Training Objective
025	Training Lesson
026	Training Test
027 and Up	(Future Use)

2.11.2 Task Numbers

Task codes are used to identify types of information found in headings, paragraphs, figures, tables, chapters, and sections of a document. The task code (texttype = n) is the main code specification within the %bodyatt attribute set.

<u>NUMBER</u>	<u>TEXTTYPE</u>	<u>CDM EQUIVALENT</u>
100		
110	access	<desc type = access ways
115	action	
120	adjust/align/calibrate	<sysinfo\<function type = adjustment\alignment\ calibration
130	administrative destruct	
135	answer	
140	arrangement	<desc type = arrangement
150	assemble	<sysinfo\<function type = disassembly\assembly
160	automated test equipment procedures	
170	bonding	<maintprc type = bonding
180	cause	<sysinfo\<fltinfo\ <faultiso\<statiso\ <symptom\<causeby
190	check list	
200	checkout	<sysinfo\<fltinfo\ <faultiso\<dynaiso\ <mdas\cmdasrect cproc
205	circuit breakers	
210	clean	<sysinfo\<function type = cleaning
230	component description	
240	component locator	
250	component replacement checks	
260	computer program flow charts	
270	computer program listings	
280	connector	<maintprc type = connections
290	consumable	<function\<task\ <consum
300	consumable record	
305	corrective action	
310	danger area	<desc type = danger areas
315	date	
320	description	<desc
330	detailed theory of operation	<sysinfo\<desc type = theory of operation

<u>NUMBER</u>	<u>TEXTTYPE</u>	<u>CDM EQUIVALENT</u>
340	diagram	<graph2d mode = station diagram
360	disassemble	<sysinfo\<function type = disassembly\assembly
370	equipment record	
380	fastener	<maintprc type = fastener
390	fault description	<sysinfo\<fltinfo\ <fltdesc
400	fault index	
410	fault isolation index	
420	follow-on maintenance	
430	function	<sysinfo\<function
435	functional diagram	<graph2d track = illustration
440	general information	<sysinfo\<idinfo
450	general procedure or operational checkout	
460	Government standard	<sysinfo\<function\<task\ <input\<consu\<dataunit type = govtstd
470	grounding	
480	illustrated parts breakdown	<sysinfo\<partdata\<ipb
485	indication	
490	initial date	
500	in-process inspection	<step ipi
510	in-process inspection code	<function\<task\<genipi type = ipic
520	input conditions	
530	inspect	<sysinfo\<function type = scheduled inspection
540	install	<sysinfo\<function type = install
545	International Standard Information	
550	leveling	<function type = leveling and weighing
560	lifting and shoring	<function type = lifting and shoring
565	line item number	
570	local manufacture	
575	logistics control number	
580	lubricate	<sysinfo\<function type = lubricating
590	maintenance	
600	maintenance parts list	<sysinfo\<partdata\<mpl
610	manufacturer's code	<sysinfo\<function\<task\ <input\<consum\<dataunit type = mfrcode

<u>NUMBER</u>	<u>TEXTTYPE</u>	<u>CDM EQUIVALENT</u>
615	manufacturer	<sysinfo\<idinfo type = manufacturer
620	master input conditions	<sysinfo\<function\<task\ <input
623	material name	
626	material number	
630	materials information	
632	measurement	
634	model name	
635	model number	
637	national stock number	<function\<task\<equip type = nsn
640	nomenclature	<sysinfo\<idinfo
645	objective	
650	overhaul	
670	pack	
675	page number	
680	parking and mooring	<function type = parking and mooring
690	part description	<sysinfo\<partdata
700	parts list	<sysinfo\<partdata\<mpl
704	part name	<sysinfo\<partdata\<mpl\ <partinfo type = noun identifier
705	part number	<sysinfo\<partdata\ <partbase type = part number
710	personnel	<function\<task\<personnl
720	pictorial view	<graph2d
730	placards and marking	<function type = placards and markings
740	preparation for maintenance	<sysinfo\<fltinfo\<test\ <stepgrp type = preparatory
750	preparation, follow-on maintenance	
753	question	
756	reference designator	<sysinfo\<partdata\<ipb\ <mpl\<partinfo type = reference designator
760	required conditions	<function\<task\<reqcond
770	rebuild	
780	receive	
790	remove	<sysinfo\<function type = removal\install
800	repair	<sysinfo\<function type = repair
810	replace	
820	safety summary	
830	schematic diagram	<graph2d mode = schematic

<u>NUMBER</u>	<u>TEXTTYPE</u>	<u>CDM EQUIVALENT</u>
840	servicing	<function type =servicing
845	serial number	
850	set-up	
855	smr code	<sysinfo\<partdata\ <partbase type = smr
860	special instructions	<sysinfo\<fltinfo\<test\ <step specinstr
870	special tools information	<function\<task\<equip type = special tools
873	sssn	
876	special tool name	
877	special tool number	
880	stow	
890	symbols	
900	system description	<sysinfo\<idinfo\<desc
910	system tie-in information	
920	tcto	
925	tcto number (time compliance technical order)	
930	tcto record	
935	test	<sysinfo\<fltinfo\<test type = test
940	test equipment information	<function\<task\ <equip type = test equipment
941	test equipment name	
942	test equipment number	
943	test question	
946	theory of operation	<sysinfo\<desc type = theory of operation
947	tool name	
948	tool number	
949	torque value	<maintprc type = torque
950	towing and taxiing	<function type = towing and taxiing
955	transport	
960	troubleshooting or fault isolation	<sysinfo\<fltinfo\ <faultiso
965	unpack	
970	usability information	<sysinfo\<idinfo type = usability information
975	vehicle description	<desc type = arrangement
980	walkways	<desc type = walkways
985	wiring diagram	<graph2d mode = wire
990	wiring list	
993	wiring procedures	<maintprc type = wiring procedures
997	work cards	

APPENDIX B

CDM/ITDS COMPARISON STUDY

The results of the CDM and the ITDS comparative analysis, using the CDM as the baseline for comparison, are detailed in this section.

APPENDIX B

Table of Contents

<u>Section</u>	<u>Page</u>
1.0 Attribute Sets.	55
2.0 CDM Elements.	58

1.0 Attribute Set

<u>ATTRIBUTE SET</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
%yesorno		%yesorno	
%applinks			1.
%ids	id	%xref xrefid	
%secur	security restrict release codeword scilevel diglyph	%security security restrict release codeword scilevel diglyph	
%stats (%bodyatt)	valstat verstat config security track version	%bodyatt %bodyatt val %bodyatt verif <configid As for %secur <config track <revnum, <chgno	
%xrefs	xrefid exrefid xreftype	<xref xrefid,assoc <xref docno,assoc,xrefid <xref type	2.
%text		No Equivalent	
%content	sssn level type refdes nature	<refdes %bodyatt form	3.

<u>ATTRIBUTE SET</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
%links	linkid	<branch branchid	4.
	linktype		
	title	<subject	
	text	<text1, <text2, <runtext	
	training	<confgdf	
	warning	<warning	
	caution	<caution	
	note	<note	
	graph2d	<graphic	
	graph3d	<graphic	
	table	<table	
	prompt	<branchdf prompt	
	eval	<branch previous	
	audio	<video audio	
	bitmap	No Equivalent	
	video	<video	
	anim	No Equivalent	
	software	<jumpout	
	%applinks		
	value	<branch type = data	
	branchid	<branch xrefid	
	rulelog	<return	
	brex	No Return Needed	
	exbrex	No Return Needed	
	exbrret	loc = nextjump	
	brexret	loc = repeat	
	and	loc = next	
	sequence	No Equivalence	5.
	priority	%emph	

DETAIL REFERENCES

1. %applinks - What is it?
2. %xrefs xreftype - CDM identifies type of element
ITDS identifies type of document structure
3. %content level - must be evaluated and assigned as appropriate para0, subpara* or paratxt*
type - ITDS models most CDM dataunit types as distinct tags or with appropriate three digit texttype codes
e.g. CDM <idinfo\<dataunit type = modelno
ITDS <modelno
CDM <desc\<dataunit type = walkways
ITDS <textX texttype = 980
4. %links - There are fundamental differences in the way branching is done in ITDS and CDM. Reference Section 2.1.1.
5. %links sequence - ITDS assumes decision/branch to be completed in the same order as which they appear.

2.0 CDM Elements

Where applicable, all possible types of dataunits within a tag have been listed below the tag.

<u>CDM ELEMENT</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<maintinf	%ids	CDM Content Division As for %ids	
	%content	As for %content	
<contstrc	%ids	CDM Content Division As for %ids	
	%content	As for %content	
<idinfo	%ids	CDM Content Division As for %ids	
	%content	As for %content	
	nature	%bodyatt form	
	<dataunit type		
	nomen	<nomen	
	mfr	<mfr	
	contrno	<contrno	
	modelno	<modelno	
	orig rel dat	<date	
	late chg dat	<chgdate	
	maint level	<maintlvl	
	serialno	<serno	
	distrib	%secur release	
	use info	texttype = 970	
	pubno	<pubno	
	prepubno	<prepubno	
	effdate	<notice type = effdate	
		<dtissue	
	supersedure	<notice type = supersedure	
	auth	<notice type = authority	
		<signer	
<desc	%ids	CDM Content Division As for %ids	
	%content	As for %content	
	nature	%bodyatt form	
	<dataunit type		
	arrang	texttype = 140	
	wlkwys	texttype = 980	
	accsswy	texttype = 110	
	dgrarea	texttype = 310	

<u>CDM ELEMENT</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<maintproc	%ids %content nature	CDM Content Division As for %ids As for %content %bodyatt form	
	<dataunit type		
	wir proc	texttype = 993	
	bonding	texttype = 170	
	torque	texttype = 949	
	fastener	texttype = 380	
	connect	texttype = 280	
<function	%ids %content	CDM Content Division As for %ids As for %content	
	<dataunit type		
	lift&shore	texttype = 560	
	lvl&weigh	texttype = 550	
	tow&taxi	texttype = 950	
	park&moor	texttype = 680	
	plac&mark	texttype = 730	
	servicing	texttype = 840	
<task	%ids %content	CDM Content Division As for %ids As for %content	
<genipi	%ids %content nature	CDM Content Division As for %ids As for %content %bodyatt form	
<input	%ids %content nature	CDM Content Division As for %ids As for %content %bodyatt form	
	<dataunit type		
	safty conds	texttype = 820	
	confg conds	<configid	
	supprt data	xrefid	
	torque vals	texttype = 949	
<equip	%ids %content equipid alteqids config nature	CDM Content Division As for %ids As for %content configst/configend %bodyatt form	1.
	<dataunit type		
	nomen	texttype = 640	

<u>CDM ELEMENT</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<consum	%ids	CDM Content Division	2.
	%content	As for %ids	
	nature	As for %content	
	<dataunit type	%bodyatt form	
	nomen	texttype = 640	
	mrfcode	texttype = 610	
<reqcond	gvtstnd	texttype = 460	3.
	quantity	texttype = NEW	
	%ids	CDM Content Element	
	%content	As for %ids	
	nature	As for %content	
		%bodyatt form	

DETAIL REFERENCES

1. equip type - test eqp texttype = 940, 941, 942
 spec1 tools texttype = 870, 876, 877
 grnd hdlg eqp
2. consum type - expend itms
 support mtrl
 attchng hdwe
3. reqcond type - aircraft safe for maintenance
 aircraft on jacks

<u>CDM ELEMENT</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<personnl	%ids number nature	texttype = 710 As for %ids texttype = NEW %bodyatt form	
<stepgrp	%ids %content	CDM Content Division As for %ids As for %content	
<step	ipi person %ids %content specinstr reqtype verb nature	CDM Content Division texttype = 500 texttype = 710 As for %ids As for %content texttype = 860 <branch type = select menu Various texttypes %bodyatt form	
<endcond	%ids %content nature	CDM Content Division As for %ids As for %content %bodyatt form	
<followon	%ids %content nature	CDM Content Division As for %ids As for %content %bodyatt form	
<sysinfo	%ids %content	CDM Content Division As for %ids As for %content	
<sysinfo\<idinfo	%ids %content nature	CDM Content Division As for %ids As for %content %bodyatt form	
<sysinfo\<desc	%ids %content nature	CDM Content Division As for %ids As for %content %bodyatt form	
<dataunit type	theory_of_op symsect	texttype = 946 <symsect	

<u>CDM ELEMENT</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<sysinfo\<function	%ids	CDM Content Division	
	%content	As for %ids	
<dataunit type		As for %content	
	adjustment	texttype = 120	
	alignment	texttype = 120	
	calibration	texttype = 120	
	disassemble	texttype = 360	
	assemble	texttype = 150	
	remove	texttype = 790	
	install	texttype = 540	
	repair	texttype = 800	
	cleaning	texttype = 210	
	lubricating	texttype = 580	
	servicing	texttype = 840	
	sched inspect	texttype = 530	
<partdata	%ids	CDM Content Division	
	%content	As for %ids	
		As for %content	
<ipb	%ids	texttype = 480	
		As for %ids	
<mpl	%ids	<pslist, texttype = 600	
	%content	As for %ids	
	%links	As for %content	
		As for %links	
<partinfo	%ids	CDM Content Division	
	%content	As for %ids	
	partbase	As for %content	
	mpl	texttype = NEW	
	nature	texttype = NEW	
		%bodyatt form	
<dataunit type	noun_id	<nomen, texttype = 640	
	noun_type	<type	
	unit_asmbly	texttype = NEW	
	fig_indx_no	texttype = NEW	
	refdes	texttype = 756	
	usble_code	texttype = NEW	
	leg_symb	texttype = NEW	

<u>CDM ELEMENT</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<partbase	%ids %content nature	CDM Content Division As for %ids As for %content %bodyatt form	
<dataunit type	part number fscm smr hci	<partno texttype = 705 texttype = 610 texttype = 855 texttype = NEW	
<fltinfo	%ids %content	CDM Content Division As for %ids As for %content	1.
<faultrpt	%ids %content	CDM Content Division As for %ids As for %content	
<statrpt	%ids %content nature	CDM Content Division As for %ids As for %content %bodyatt form	
<fault	%ids %content isoref nature fltcode	CDM Content Division As for %ids As for %content texttype = %bodyatt form texttype = 400	
<dynarpt	%ids %content name	CDM Content Division As for %ids As for %content No Equivalent	
<faultiso	%ids %content	CDM Content Division As for %ids As for %content	

DETAIL REFERENCES

1. <fltinfo - ITDS must identify all aspects of fault reporting. These include fault reports, fault codes, fault descriptions, causes, symptoms and tests.

<u>CDM ELEMENT</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<statiso	%ids %content test fltcode	CDM Content Division As for %ids As for %content xref texttype = 400	
<statiso\<equip	%ids %content equipid alteqids config nature	As for %ids As for %content <confgst/<confgend %bodyatt form	
<symptom	%ids %content	CDM Content Division As for %ids As for %content	
<causeby	%ids %content nature	texttype = 180 As for %ids As for %content %bodyatt form	
<dynaISO	%ids %content name	CDM Content Division As for %ids As for %content No Equivalent	1.
<mdas	%ids %content	CDM Content Division As for %ids As for %content	
<mdasym	%ids %content faultid kind nature	CDM Content Division As for %ids As for %content No Equivalent No Equivalent %bodyatt form	
<mdasflt	%ids %content mtbf nature	CDM Content Division As for %ids As for %content No Equivalent %bodyatt form	

DETAIL REFERENCES

1. <dynrapt - Unsure if this element and all elements contained within it will be in the CDM.

<u>CDM ELEMENT</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<mdastest	%ids	CDM Content Division	
	%content	As for %ids	
	mtbf	As for %content	
	outcomes	No Equivalent	
	time	No Equivalent	
	to	No Equivalent	
	proc	xrefid	
	tto	No Equivalent	
	tproc	xrefid	
	access	No Equivalent	
	nature	texttype = 110	
		%bodyatt form	
<mdasrect	%ids	CDM Content Division	
	%content	As for %ids	
	mtbf	As for %content	
	avail	No Equivalent	
	kind	No Equivalent	
	rplvl	No Equivalent	
	rectime	No Equivalent	
	chktime	No Equivalent	
	spptime	No Equivalent	
	rto	No Equivalent	
	rproc	xrefid	
	cto	No Equivalent	
	cproc	xrefid	
	tto	No Equivalent	
	tproc	xrefid	
	nsn	No Equivalent	
	access	texttype = 637	
	nature	texttype = 110	
		%bodyatt form	
<mdasaccs	%ids	CDM Content Division	
	%content	As for %ids	
	time	As for %content	
	to	No Equivalent	
	proc	xrefid	
	nature	No Equivalent	
		%bodyatt form	
<test	%ids	texttype = 935	
	%content	As for %ids	
	outcomes	As for %content	
		No Equivalent	

<u>CDM ELEMENT</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<test\<stepgrp	types preparatory	texttype = 740	
	access related	texttype = 110	
	test	texttype = 935	
	rectification	texttype = 305	
	%ids	As for %ids	
	%content	As for %content	
<test\<step	ipi	CDM Content Division	
	person	texttype = 500	
	%ids	texttype = 710	
	%content	As for %ids	
	specinstr	As for %content	
	reqtype	texttype = 860	
	verb	<branch type = select menu	
	nature	Various texttypes	
		%bodyatt form	
<rectif	%ids	CDM Content Division	
	%content	As for %ids	
	refdes	As for %content	
	nsn	texttype = 756	
		texttype = 637	
<rectif\<stepgrp	%ids	CDM Content Division	
	%content	As for %ids	
		As for %content	
<rectif\<step	ipi	CDM Content Division	
	person	texttype = 500	
	%ids	texttype = 710	
	%content	As for %ids	
	specinstr	As for %content	
	reqtype	texttype = 860	
	verb	<branch type = select menu	
	nature	Various texttypes	
		%bodyatt form	

<u>CDM ELEMENT</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<refstrc	%ids %content	CDM Content Division As for %ids AS for %content	
<graph2d	%ids %content srcgraph prmgraph name type orient pixrange	<graphic As for %ids As for %content segment No Equivalent name <figure type rotate width, depth	
<graph3d	%ids %content srcgraph prmgraph name type orient pixrange	<graphic As for %ids As for %content segment No Equivalent name <figure type rotate width, depth	
<prompt	%ids %content	CDM Content Division As for %ids As for %content	
<prmpval	%ids %content	<branch type = correct As for %ids As for %content	
<table	%ids %content name	<table As for %ids As for %content <table\<title	
<colhddef	%ids %content colnum datatype colname	<colhddef As for %ids As for %content colnum No Equivalent	

<u>CDM ELEMENT</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<entry	col row %ids %content nature	<entry col row As for %ids As for %content %bodyatt form	
<dictitem	%ids %content term nature	CDM Content Division As for %ids As for %content <term %bodyatt form	
<verb	%ids %content nature	Various Texttypes As for %ids As for %content %bodyatt form	
<dataunit	%ids %stats %content	Not Applicable	
<datalink	%ids %links %xrefs	&{entity name}; As for %ids As for %links As for %xrefs	
<data	%ids %content	CDM Content Division As for %ids As for %content	
<grphprim	%ids %content file coding	Not Applicable	
<textunit	%ids %content	<!Entity As for %ids As for %content	1.
<dictref	%ids dictid %content	Not Applicable	

<u>CDM ELEMENT</u>	<u>ATTRIBUTE</u>	<u>ITDS EQUIVALENT</u>	<u>DETAIL REFERENCE</u>
<equipref	%ids equipid %content	Not Applicable	
<verbref	%ids verbid %content	Not Applicable	
<ftnoteref	%ids ftnoteid %content	<ftnotest/<ftnotend As for %ids No Equivalent As for %content	

DETAIL REFERENCES

1. textunit - CDM uses to identify a character string. Actual definition of the character string is determined by the linktypes of the datalinks which link to the textunit. In other words, if textunit is linked via a title datalink, the character string within the textunit is a title. If the same text is linked via a datalink with linktype = prompt, then the character string is also a prompt.